

Hailed for a comet, he dabbled in the deep

Halley pondered inner and outer space at the same time.

By Hillary Hauser
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As the name of the English astronomer and mathematician Edmund Halley blazes across the skies of newspapers, magazines and books, telescope sales have skyrocketed with the approach of the comet that bears his name.

Maybe we should remember our periscopes, too.

Few people realize that there were times when old Halley was busier at the bottom of the sea than he was in outer space, and that he developed diving equipment far in advance of his time.

In Halley's era, 1656-1742, no one had figured out how to build a decent snorkel through which men could breathe on the water's surface. Yet Halley skipped all those preliminaries and went straight to the bottom — about 60 feet.

That was a significant depth for those days. Never mind that no one understood what happened to the human body under pressure — things like "bends" or air embolism. These nasties weren't to be discovered for more than 200 years. In those days, the idea was to try now, pay later.

Actually, Halley joined a long line of inventors who wondered about inner and outer space at the same time. Some say that the English philosopher Roger Bacon wrote about submarine operations as early as 1250. Leonardo da Vinci (1452-1519), who mused about man in flight, also designed a diving helmet out of leather, covered with spikes to protect the diver from sea monsters.

In 1690, about eight years after discovering his comet, Edmund Halley designed a wooden bell "coated with lead so heavy it would sink empty."

Halley's Diving Bell looked like a traditional Christmas bell, and measured 3 feet in diameter at the top and 5 feet at the bottom, and 8 feet in height. There was a bench around the bell's mouth for divers to sit on.

"I distributed the weight about its bottom, that it would go down in a perpendicular situation and no other," Halley wrote. "In the top I fixed a strong but clear glass, as a window, to let in the light from above, and likewise a cock to let out the hot air that had been breathed."

While it isn't certain whether the divers actually got to do anything once underwater but sit and breathe, an early drawing of the bell reveals a diver in knightly garb, walking on the bottom and carrying a medieval

weapon — presumably to ward off any sea monsters that persisted from Leonardo's day.

Cargoes of air were lowered from the surface in 35-gallon barrels, and flexible tubes transferred air from the barrels to the submerged chamber.

Halley and four daring divers reportedly stayed at 10 fathoms (about 60 feet) for 1½ hours in the bell, breathing the air that was barrelled down to them. Halley reported that the divers' sole problem was a pain in the ears, "as if a quill had been thrust into them." But this sensation was "only temporary," he said.

This is a sure-fire indicator that the early underwater pioneers did not understand the effects of pressure on the human body.

When you think about it, sixty feet is no "ordinary" depth. As it turns out, Halley was not only ignorant about the effects of pressure on his men's ears, but he also did not understand the effects of pressurized nitrogen.

Every one of Halley's divers, in fact, should have been "bent" after this experiment. A diver can only stay for 60 minutes at 60 feet, and after that, he has to make a decompression stop on the way back to the surface, to avoid the "bends."

It is conceivable that Halley and his men stopped at ten feet for a while on the way back up, and the maneuver was never recorded in "Philosophical Transactions."

Or, they were all seized with the bends once they got to the boat, but the condition passed after they lounged around on deck.

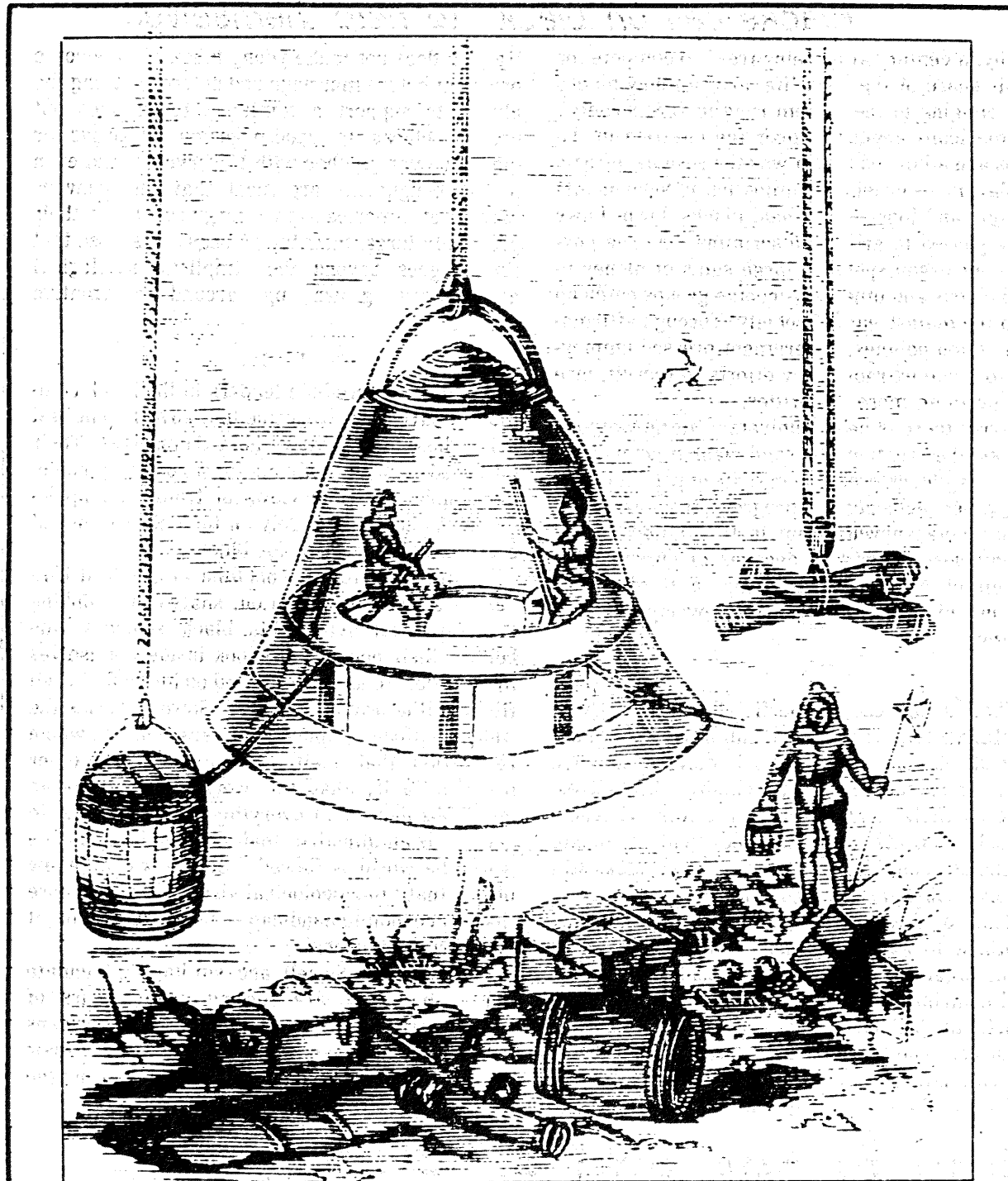
Or, their depth gauges weren't working that day and they really didn't get to 60 feet. Or, their time clocks weren't working right and they weren't really submerged for 90 minutes.

Whichever it was, we cannot help but remain in awe of the early pioneers who did what they did without knowing what they were doing.

And certainly, those daring divers deserve a big applause for agreeing to sit around in a bell "coated with lead so heavy it would sink empty," breathing hot air brought to them in barrels.



About the writer
Hillary Hauser has covered underwater topics for *National Geographic* and *Esquire*, and is a contributing editor for *Skin Diver* magazine.



Halley's Diving Bell.